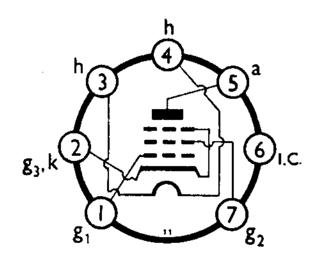


MINIATURE OUTPUT PENTODE
6·3V INDIRECTLY HEATED

N78

NOVEMBER, 1953

BASE CONNECTIONS AND VALVE DIMENSIONS



View from underside of base.

Base : B7G
Bulb : Tubular

Overall length :	64—70	mm.
Seated length :	58—64	mm.
Max. diameter :	19	mm.

RATING

Pentode Connection

V_h		6·3		V
I_h		0·64	approx.	A
$v_{h\text{-}k}$ (pk)		150	max.	V
V_a		250	max.	V
V_{g2}		250	max.	V
p_a		9	max.	W
p_{g2}		3	max.	W
μ	at $V_a = V_{g2} = 250$, $V_{g1} = -5$	420		
r_a	at $V_a = V_{g2} = 250$, $V_{g1} = -5$	40		kΩ
g_m	at $V_a = V_{g2} = 250$, $V_{g1} = -5$	10·5		mA/V

Triode Connection

$V_{a,\,g2}$		250	max.	V
$p_{a,\,g2}$		12	max.	W
μ	at $V_{a,\,g2} = 250$, $V_{g1} = -5$	24		
r_a	at $V_{a,\,g2} = 250$, $V_{g1} = -5$	2·1		kΩ
g_m	at $V_{a,\,g2} = 250$, $V_{g1} = -5$	11·4		mA/V

CAPACITANCES (of cold unscreened valve)

$c_{a\text{-}all}$ 10·5 pF $c_{g1\text{-}all}$ 11·5 pF $c_{a\text{-}g1}$ 0·3 pF

TYPICAL OPERATION

Single Valve, Class A, Pentode Connection

V_a	250		V
V_{g2}	250		V
V_{g1} (o)	−5	approx.	V
I_a (o)	35		mA
I_{g2} (o)	5·5		mA
R_k	120		Ω
v_{in} (pk)	5		V
R_L	7		kΩ
P_{out}	4		W
D	9·2		%

MARCONI'S WIRELESS TELEGRAPH COMPANY LIMITED

Head Office: Marconi House, Chelmsford . Telephone: Chelmsford 3221 . Telegraphic Address: Expanse, Chelmsford

Push-pull, Class AB$_1$, Pentode Connection

Data per pair unless otherwise stated

V_a	220	250	350	V
V_{g2}	220	250	275	V
V_{g1} (o) approx.	−3·2	−5	−7·1	V
I_a (o)	82	70	46	mA
I_a (max. sig)	82	73	51	mA
I_{g2} (o)	13	11	6·5	mA
I_{g2} (max. sig)	16·5	16·5	20	mA
R_k (per valve)	68	120	270	Ω
v_{in} (pk) (g_1-g_1)	7	11·2	20	V
R_L (a-a)	9	9	18	kΩ
P_{out}	5	9	12·6	W
D	3	4·6	4·8	%

Push-pull, Class AB$_1$. Triode Connection

Data per pair unless otherwise stated

$V_{a, g2}$	300	350	V
V_{g1} (o) approx.	−7·5	−9·5	V
$I_{a, g1}$ (o)	67	57	mA
$I_{a, g2}$ (max. sig)	73	64·5	mA
R_k (per valve)	220	330	Ω
v_{in} (pk) (g_1-g_1)	15·5	21	V
R_L (a-a)	5	8	kΩ
P_{out}	4·4	6·3	W
D	1·5	1·6	%

R.F. Power Amplifier and Oscillator, Single Valve. Class C Telegraphy

Pentode Connection. (Unmodulated key-down conditions)

V_a	300	V
V_{g2}	150	V
V_{g1}	−25	V
I_a	65	mA
I_{g2}	14	mA
*I_{g1}	5	mA
R_L	1·65	kΩ
p_a	9	W
P_{out}	10·5	W

* Subject to wide variation.

Frequency Multiplier. Single Valve. Pentode Connection.

Key-down conditions.

f_{in}	20	50	20	Mc/s
f_{out}	40	100	60	Mc/s
V_a	350	260	270	V
V_{g2}	150	200	160	V
V_{g1}	−60	−100	−120	V
I_a	52	55	52	mA
I_{g2}	14	9	12	mA
*I_{g1}	3	5	6	mA
R_L	2·2	1·1	1·18	kΩ
p_a	9	9	9	W
P_{out}	9·2	5·3	5·1	W

* Subject to wide variation.

GRID RESISTOR

The maximum permissible D.C. resistance between control grid and cathode is limited to 0·27 MΩ ± 20% with auto-bias, and 0·1 MΩ with fixed bias.

SCREENING

No internal or external screening is fitted to the valve.

MOUNTING

Any position.

RETAINING

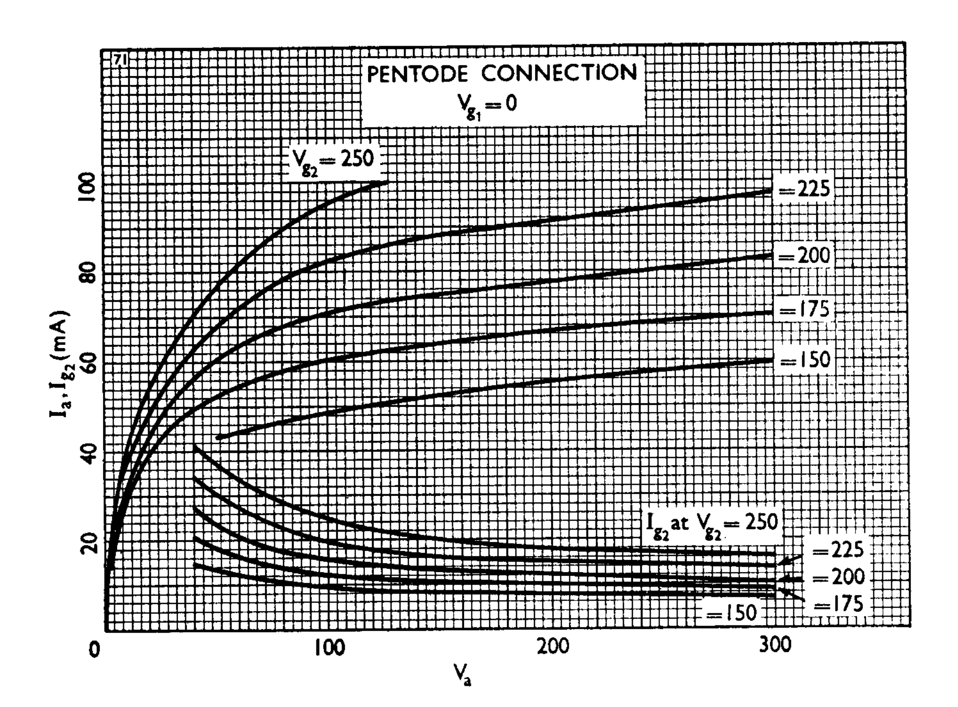
A retaining device should be used.

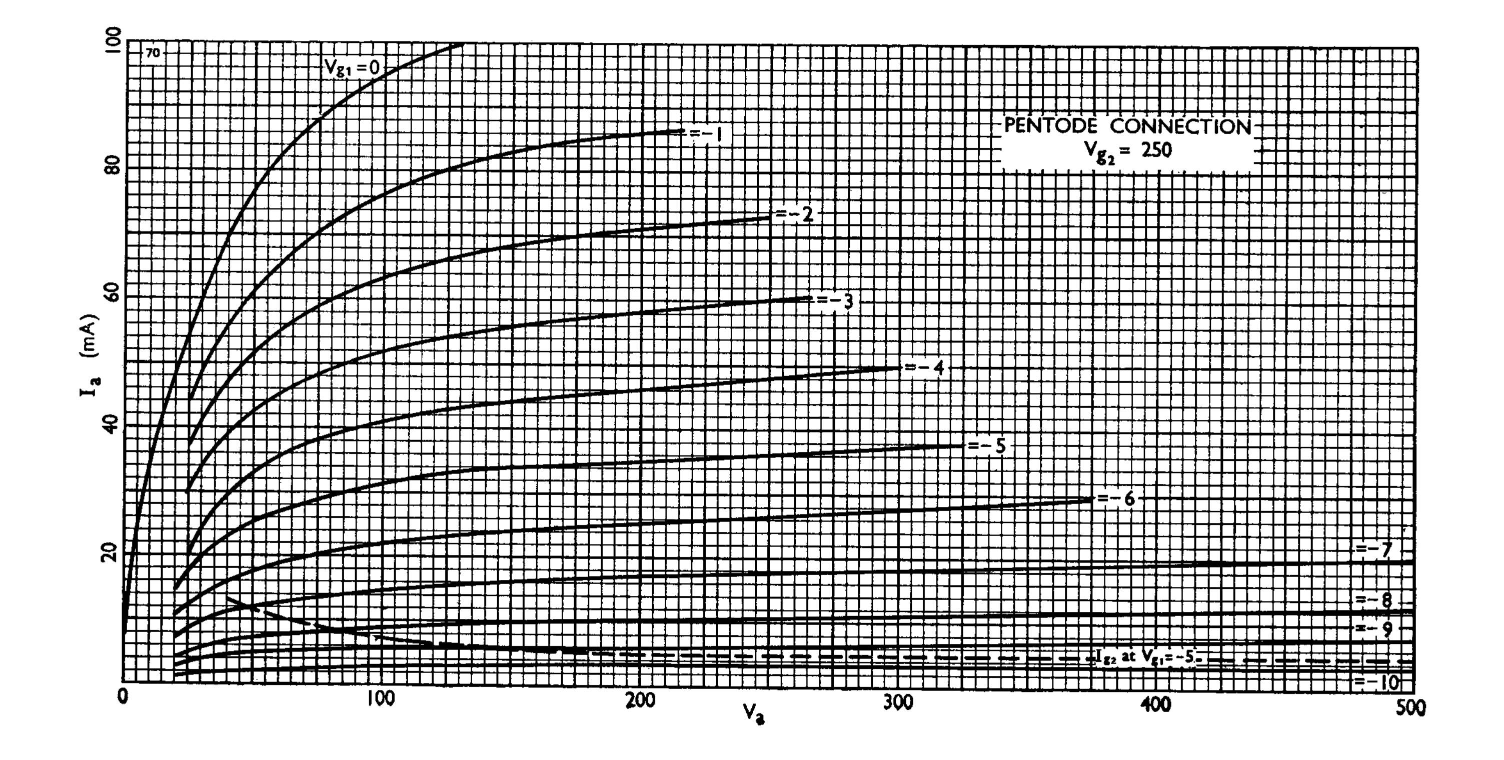
VENTILATION

Free air circulation round the bulb is preferable. If a retaining device in the form of a canister is used, the surfaces should be blackened. The temperature of the hottest part of the bulb must not exceed 250°C.

MICROPHONY

Although this is of a very low order, equipment should be designed to minimise microphony.

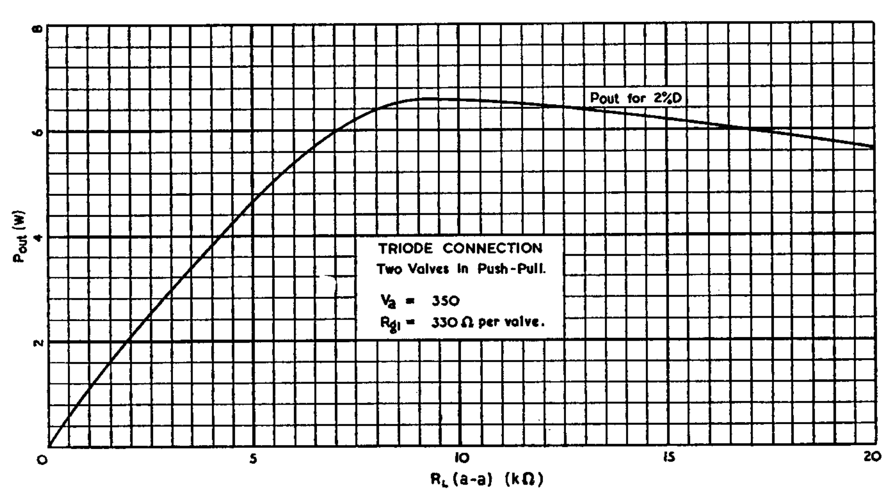


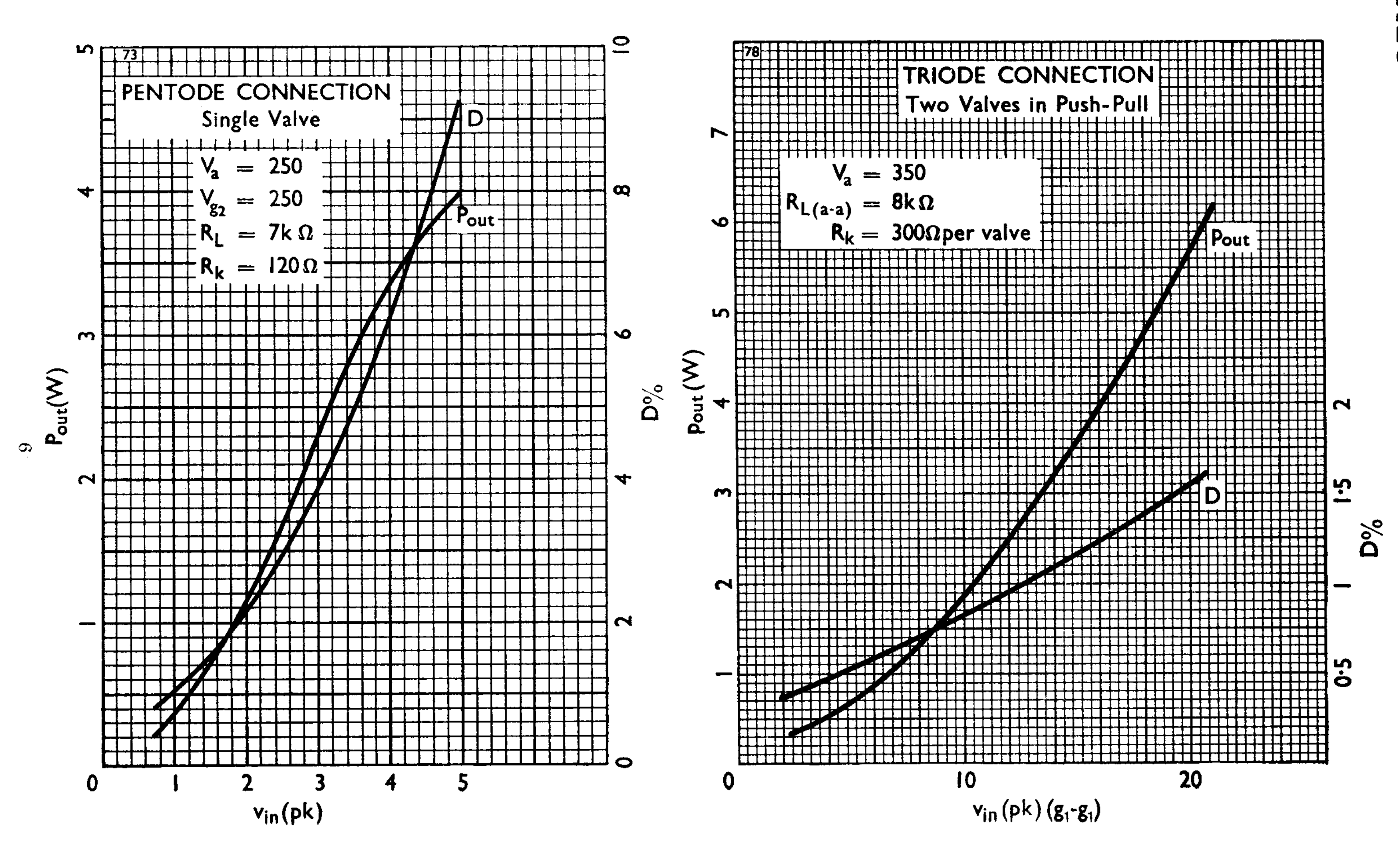

PENTODE CONNECTION
V_{g2} = 250
V_{g1} = 0
= −1
= −2
= −3
= −4
= −5
= −6
= −7
= −8
= −9
= −10
I_{g2} at V_{g1} = −5
V_a
I_a (mA)
0
100
200
300
400
500
20
40
60
80
100
70

TRIODE CONNECTION

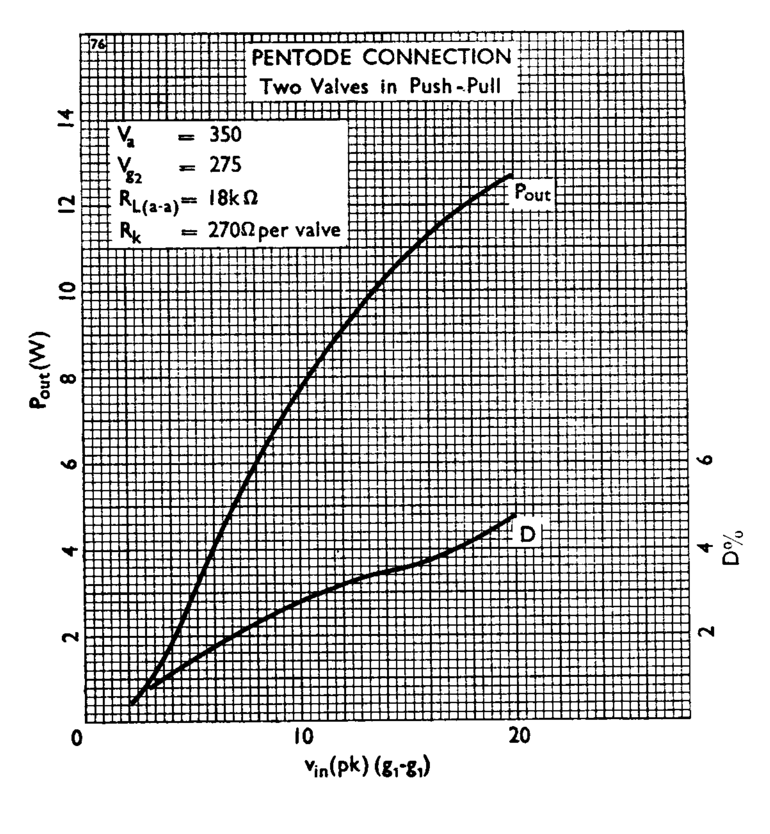
I_a (mA)

V_a

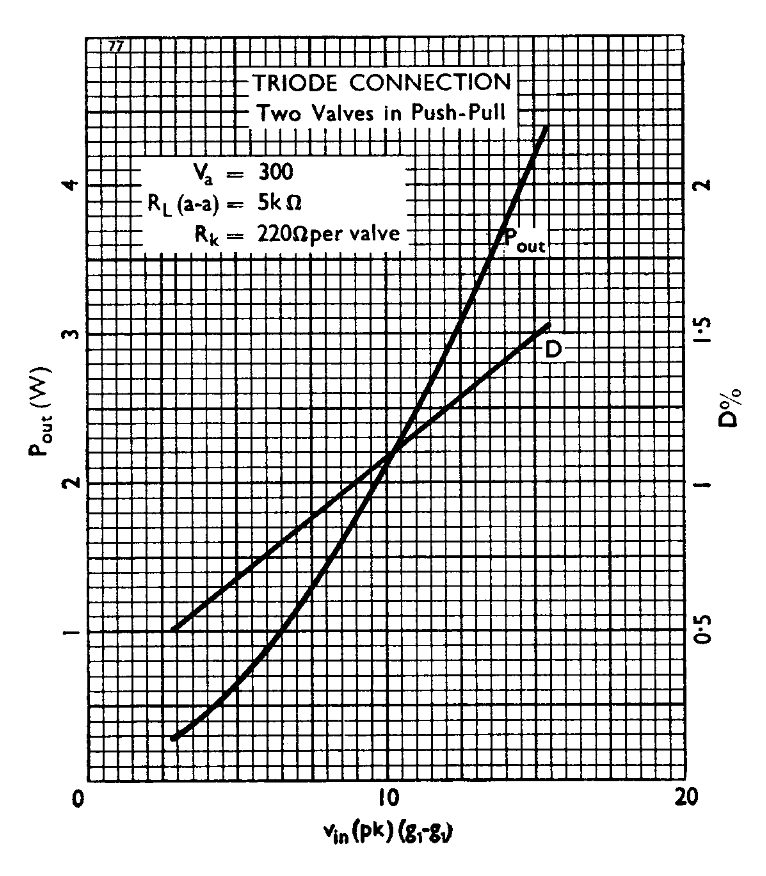




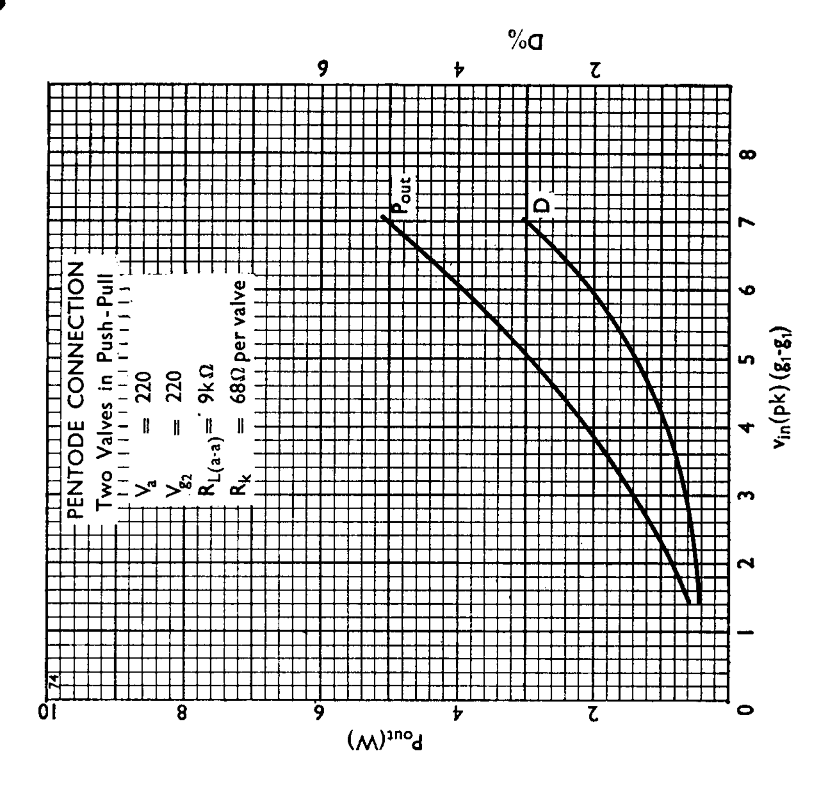
73
PENTODE CONNECTION
Single Valve
V_a = 250
V_{g2} = 250
R_L = 7k Ω
R_k = 120 Ω
D
P_{out}
P_{out}(W)
D%
$v_{in}(pk)$
78
TRIODE CONNECTION
Two Valves in Push-Pull
V_a = 350
$R_{L(a\text{-}a)}$ = 8k Ω
R_k = 300Ω per valve
P_{out}
D
P_{out}(W)
D%
$v_{in}(pk)$ $(g_1\text{-}g_1)$

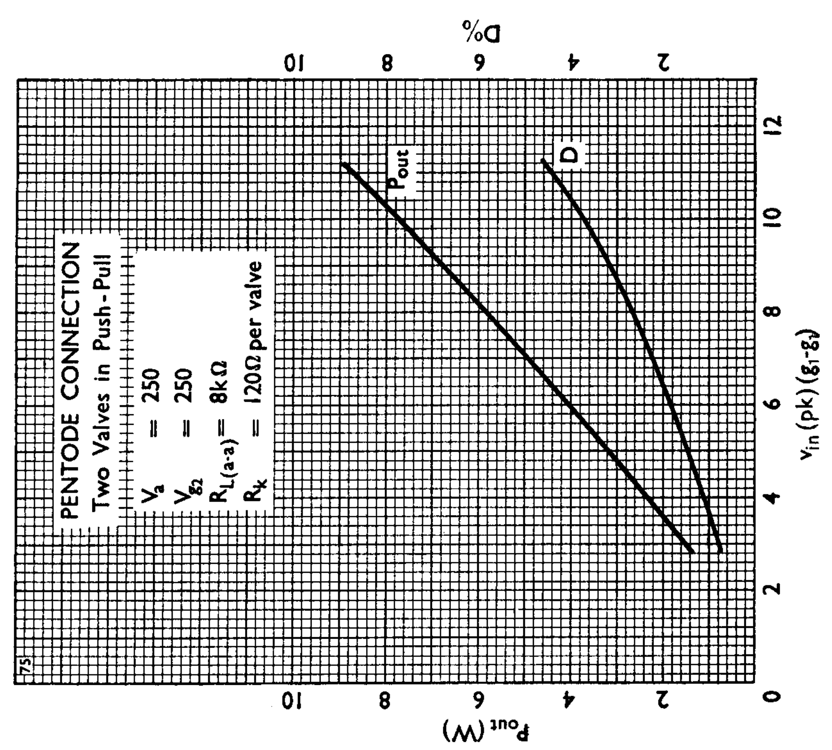


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PENTODE CONNECTION
Two Valves in Push-Pull
V_a = 350
V_{g2} = 275
$R_{L(a-a)}$ = 18k Ω
R_k = 270Ω per valve
P_{out}
D
P_{out}(W)
D%
$v_{in}(pk)(g_1-g_1)$
0
2
4
6
8
10
12
14
20



77
TRIODE CONNECTION
Two Valves in Push-Pull
V_a = 300
R_L (a-a) = 5k Ω
R_k = 220Ω per valve
P_{out}
D
P_{out} (W)
D%
$v_{in}(pk)(g_1-g_1)$
0
0·5
1
1·5
2
3
4
10
20





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